

# TSR User Manual

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## 1 Introduction

### 1.1 Purpose

This document is used to introduce how to use the software resource repository of Trustie (TSR). The repository administrator, repository users or other people interested to TSR could understand how to manage and use TSR by this document.

### 1.2 Background

Software resources include all software products involved in software development, such as software code, documentation, data, and so on. Reuse these software resources will improve the software production efficiency and the software quality. A reusable software resource is called software asset. The practice shows that the software reuse can be effectively improved when there are efficiency software asset. At the same time, the quantity and quality of software assets are the key factors to a successful software reuse. Therefore, software resources management is the key process of software reuse, the software resources management system is called software resource, too. In detail, a software resource is an infrastructure of software reuse that provides software resource management. The main function of software resource include: collect, describe, classify and store software resource to help users search and use these software resources in management, so as to support both reuse-oriented software development and reuse-base software development process.

### 1.3 Terminology

- **Software Resource:** Software Resource is the reusable software products in software life cycle, it include software requirements, software design, code, test cases, software documentation, and so on. Software Resource can be used to create new software and related products.
- **Software Component:** Software Component is the software entity that has

relatively independent functions, can be clearly identified, gets interfaces specified by contract and depends on particular context. It can be deployed independently and almost provided by a third party.

- Software user composes software system using specific component entities. In general, the component entity is a software language code or a binary code; the component entity is embedded in the application system for end users. We call this type of component as entity component.
- **Software Service:** Software Service is the software resource implemented by distributed component technology, it could not only be composed by its services interface but also run independently. The software user interact with the software service by service access address when they use the application system. We call such software resource as service component
- **User:** An entity that can access the data or other data resources in computer system. Users in the TSR can be classified into individual users and enterprise users. A user should be registered as individual user before use the TSR, an enterprise should be registered as enterprise users before use the TSR.
- **RAS:** RAS (Reusable Asset Specification, OMG Standard, November 2005). This Specification provides a set of guidelines and recommendations about the structure, content, and descriptions of reusable software assets.
- **Software Quality Information:** The Information is used to describe the quality of software resources and evaluate the quality of software resources by evaluation model, in order to classify trustworthy software resource and help users choose software resources.
  - Quality Description Model: The model is used to describe the software quality information, it mainly includes the following items: name, description, validity, the type of software resource, quality attributes (including attribute name, description, father attribute).
- **Quality Evaluation:** The software quality information of software resource based on specific quality description model. Besides the items in quality description model, it also includes such items as resource ID, publishers, description, publish time, update time, etc.
- **Meta-Feedback Template:** Meta-Feedback Template is base of quantitative feedback information, it is used to define the feedback template and quantify the content of feedback information.
  - Feedback Template: Feedback Template is implemented base on meta-feedback template, it define the detail dimension and attributes in the meta-feedback template corresponding to specific application area.
  - Dimension and Attribute: Every feedback template have a tree structure, where the leaf nodes is called attribute and the intermediate nodes that has children nodes is called dimension. Attribute is the atomic structure of the feedback template.
  - Feedback Information: The quantitative information that is fed back for software resource or software resource repository using specific feedback template.

- **Trustworthiness Level:** The goal of trustworthiness classification is to measure the trustworthiness of software artifacts by classification, and to help users select proper artifacts on demand. The trustworthiness levels are defined according to the degree of how the software satisfies users' expectation of the trustworthiness properties.
  - **Level 0 – Unknown**  
No trustworthiness evidence is available. Whether the software can satisfy users' expectation of the trustworthiness properties or not cannot be determined. The trustworthiness level is defined as Unknown.
  - **Level 1 – Available**  
The software artifact is available, and it can run normally as it is described by the provider, which means this artifact can implicitly satisfy users' basic expectation. The trustworthiness level is defined as Available.
  - **Level 2 – Verifiable**  
Level 2 is based on Level 1. If the software artifact provider can provide software trustworthiness declaration according to the published software trustworthiness properties publication specification, and the declaration can be verified by software trustworthiness analysis tools, testing tools, verification tools or other trustworthiness evaluation methods, which means this software artifact can satisfy users' general expectation of the software trustworthiness properties and the properties have been verified, the trustworthiness level is defined as Verifiable.
  - **Level 3 – Practical**  
Level 3 is based on Level 2. If the software has been used in the related domain, and successful use case can be verified, which implicitly means that the software can satisfy users' general expectation of the software trustworthiness properties and the use case can be verified, the trustworthiness level is defined as Practical.
  - **Level 4 – Evaluable**  
Level 4 is based on Level 3. If the software trustworthiness has been evaluated by authoritative software trustworthiness classification organizations according to specific published software trustworthiness classification specification, which mean this software can satisfy users' high expectation of the software trustworthiness properties and the properties have been evaluated by the authority, the trustworthiness level is defined as Evaluable.
  - **Level 5 – Provable**  
Level 5 is based on Level 4. If all the trustworthiness properties have been strictly proved, the trustworthiness level is defined as Provable, which is the highest trustworthiness level.

## 1.4 References

Some specifications and documentations, which are useful for readers to understand this manual, are included in this section.

1. National High-Technology Research and Development Project(863 Project) application: Trustworthy Software Tools and Integration Environment
2. National 863 Project *Trustworthy Software Tools and Integration Environment* technical documentation *Software Trustworthiness Classification Specification*
3. Reusable Asset Specification OMG Available Specification Version 2.2
4. National High-Technology Research and Development Project (863 Project) research project contract. Research project name: Internet based and component centered software development platform. Research project NO.: 2001AA113070. Duration of the project: 10/2001~10/2002.
5. National High-Technology Research and Development Project (863 Project) research project contract. Research project name: Internet based and component centered software development platform. Research project NO.: 2001AA113070. Duration of the project: 10/2002~12/2004.
6. W3C specifications, documentations and drafts:
  - a) XML 1.0, <http://www.w3.org/XML/>
  - b) XML Schema, <http://www.w3.org/XML/Schema>
  - c) XML namespaces, <http://www.w3.org/TR/1999/REC-xml-names-19990114/>
  - d) SOAP 1.1, <http://www.w3.org/TR/soap/>

## 2 Brief Introduction of Trustie Software resource Repository

The goal of Trustie Software resource Repository (TSR) is to share software resource. TSR collects, organizes and manages many types of software resources from the Internet. Trustworthiness evaluation techniques and trustworthiness classification mechanisms are supported in TSR. TSR adopts high trustworthy and open architecture to inter-connect distributed multi repositories.

## 3 Environment requirements

### 3.1 Server side environment requirements

#### 3.1.1 Hardware requirements

- Server
  - Hard disk space: database space 1G; component space depends on user's requirement, and more than 5G by default is proposed.
  - Memory space: no less than 1G, and more than 2G is proposed.

#### 3.1.2 Software requirements

- Microsoft Windows 2000 Server or later
- Mysql 5.0

- Jonas5.1.0

## 3.2 Client side environment requirements

### 3.2.1 Hardware requirements

Client: Intel 586 or higher performance computer

Memory space: not less than 128M

### 3.2.2 Software requirements

Microsoft IE 6.0 or later, or other web browsers.

## 4 TSR User guide

### 4.1 sign up, sign in, modify information and log out

Before visiting all functions of this system, user has to sign up to become a valid user and sign in successfully.

#### 4.1.1 sign up

There are two sign up buttons in the middle of left side on home page. One is for personal users, another is for corporate users. Please pay attention to the red circle parts in the following figure. The left one is the link to sign up as a personal user, the right one is the link to sign up as a corporate user.



Figure 1 TSR homepage

Personal users have to fill in following information after entering the personal sign up page.

The screenshot shows the 'Sign Up' form in the Trust Integrated Environment. At the top, there's a logo for 'TrustIE' and the text 'Trust Integrated Environment for sharing and development Software Resource Repository'. Below the header, a navigation bar includes links for Home, Publish, Retrieve, Feedback, Statistics, MyResources, Version 2.1.2, 中文版 (Chinese), and English. A user status bar indicates 'guest Register New Personal User | login | Help'. The main content area has a 'Sign Up' heading. It contains two sections: 'Sign Up' and 'User Information'. The 'Sign Up' section requires fields for UserID, Password, and Confirm Password. It also includes optional fields for Get password question and Get password answer. Validation messages are displayed next to these fields: 'Attention: username is composed by letters, numbers, "\*" and "\_"', 'Attention: The password is composed by letters and numbers. The password should not be less than 4 characters', and 'Items with \* are necessary'. The 'User Information' section requires fields for user real name, E-mail, Telephone Number, Contact, and Fax. At the bottom of the form are 'submit' and 'reset' buttons.

Figure 2 personal sign up page

- UserID: UserID is used for sign in, and the length should be between 5-8 characters. UserID is composed by letters, numbers, "\*" and "\_", it's required to fill.
  - Password and Confirm Password: For security, password length should not be shorter than 5 characters, it's required to fill.
  - Get password question and Get password answer: Used for showing hints when the user forgets password, it's not required.
  - User real name: Used for identification when system administrator contacts with the user. Please fill in correctly, it's required to fill.
  - E-mail: Used for contacting with the user, it's required to fill.
  - Telephone Number: it's not required.
  - Contact: it's not required.
  - Fax: it's not required.
- Click "submit" when the user completes. He/she will sign up successfully if your information passes validation. Click "reset" to clear up all inputs.

Corporate users have to fill in following information after entering the corporate sign up page.

The screenshot shows the 'Sign Up' form within the 'Trust Integrated Environment for sharing and development Software Resource Repository'. The top navigation bar includes links for Home, Publish, Retrieve, Feedback, Statistics, MyResources, Version 2.1.2, Chinese version, English version, guest, Register New Personal User, login, and Help. The main form has two sections: 'Sign Up' and 'User Information'. The 'Sign Up' section contains fields for UserID, Password, Confirm Password, Get password question, and Get password answer. Validation messages indicate that UserID must be between 5-8 characters and composed of letters, numbers, '\*' and '\_', and that the password must be at least 4 characters. The 'User Information' section contains fields for Corporate Name, Corporate Contact Name, E-mail, Telephone Number, Contact, and Fax. A 'submit' button is located at the bottom left, and a 'reset' button is at the bottom right.

Figure 3 corporate sign up page

- UserID: UserID is used for sign in, and the length should be between 5-8 characters. UserID is composed by letters, numbers, "\*" and "\_", it's required to fill.
- Password and Confirm Password: For security, password length should not be shorter than 5 characters, it's required to fill.
- Get password question and Get password answer: Used for showing hints when the user forgets password, it's not required.
- Corporate Name: Used for the identification of corporate when system administrator contacts with the user. Please fill in correctly, it's required to fill.
- Corporate Contact Name: Used for the identification of corporate contact person when system administrator contacts with the user. Please fill in correctly, it's required to fill.
- E-mail: Used for contacting with the user, it's required to fill.
- Telephone Number: it's not required.
- Contact: it's not required.
- Fax: it's not required.

Click "submit" when the user completes. He/she will sign up successfully if his/her information passes validation. Click "reset" to clear up all inputs.

#### 4.1.2 Sign in

Users can use all functions all this system after signing up successfully. Users can sign in by inputting correct userID and password on the home page.

#### 4.1.3 Modify information

The user can modify his/her password and information after signing in

successfully.

Change password: the user needs to input new password. This new password will become valid after logging out.

Modify information: the user can modify “Get password question”, “Get password answer”, “User real name”, “E-mail”, “Telephone Number”, “Contact” and “Fax”.

#### 4.1.4 Log out

The user who has signed in successfully should log out after finishing visiting. There is a “log out” button in the middle of left side on homepage or in the top right position of other pages.

#### 4.1.5 Forget password

If the user forgets his/her password, he/she can get into “forget password” page from homepage by clicking the link ” Forget Your Password?” which is under the sign in form. The user has to input his/her UserID(User real name), E-mail and then submit. System will validate:

1. Whether the UserID has been signed up or not;
2. Whether the E-mail is the same as the email in user’s information

After passing the validation, the user will receive an email including the password related to the UserID in his/her E-mail box.

The screenshot shows a web page titled "Forget Your Password?" from the "Trust Integrated Environment for sharing and development Software Resource Repository". The page includes a logo for "Trustie" and a navigation bar with links for Home, Publish, Retrieve, Feedback, Statistics, and MyResources. A message at the top says "please enter your registered user name and E-mail, we'll send the password to you". Below this are two input fields: "UserID" and "E-mail", each with a corresponding text input box. A "submit" button is located below the input fields. At the bottom of the page, there is copyright information: "Copyright Peking University all rights reserved" and links to Home, New resource, industry news, technical reference, Technology Forum, Help, and About us. It also notes the use of Internet Explorer 6.0 or advanced version.

Figure 4 forget password page

#### 4.2 Publish Software Resources

Users can publish software resources after signing in. If a user who hasn’t signed

in clicks ‘Publish’ option on the navigation bar, he will be automatically redirected to the login page.



Figure 5. Publish option on the navigation bar

#### 4.2.1 Step 1: Fill in basic information

The following information is needed as basic information for a software resource:  
Items with \* is necessary, the others are optional.

**basic information**

|                            |   |   |
|----------------------------|---|---|
| * Name                     | Items with * are necessary  | classification tree:  |
| * Type                     | Entity Components <input checked="" type="radio"/> Service <input type="radio"/> Architecture <input type="radio"/> Tool <input type="radio"/> Other                              | extend classification tree to<br>as the classification informa<br>• Application Domain<br>• Application Environment<br>• Functionality<br>• Level<br>• Representation |
| * Description              | fill in software resource overview  |   |
| Tag                        | To add Tag for software resource, please using "," to sperate multiple Tag  |   |
| select classification term | choose from the classification tree on the right  |   |
| Software License           | <input checked="" type="radio"/> no <input type="radio"/> choose from license list <input type="radio"/> enter license in detail  | License should be abided by users   |
| fee                        | <input checked="" type="radio"/> Open Source <input type="radio"/> Free ware <input type="radio"/> Commercial Price(\$): <input type="text"/>                                     |   |
| Reference                  | statement including resource introduction sources, such as WSDL etc.  |   |
| limitation                 | restrictions in using resource, including algorithm, compiler, portability, environment etc.  |   |
| Target Environment         | the computer system, operation system and compiler, to which resource motivates   |   |
| Version                    | Resource responding version message   |   |
| Authentication method      | Describe the method of evaluation or certification of resources, including the result of evaluation or certification, the date of certification, the person of certification etc. |   |

**fill in other information**

**next**

Figure 6. Fill in basic information

- Name: name is needed from every software resource, it cannot be empty. Chinese or English are both accepted.
- Type: TSRR supports five types of software resources: Component, Service, Tool, Architecture, Other. ‘Component’ is default value. You are only required to provide access url of the resource at the second step if you choose type ‘service’; otherwise artifacts of the software resource are needed at the second step.
- Description: Overview introduction to the software resource.
- Tag: Tags used to label the software resource. Tags as separated by comma ‘,’.
- Classification term: Classification information of the software resources. Select classification terms on the right classification tree. Multiple terms are allowed.

- Software license: License which should be complied with during software resource distribution. You can select it from license list, or fill in your own license. Please refer to Appendix A for license list.
- Fee: Three options: open source, free ware, or commercial.
- Price: Price of the software resource, in U.S. dollar.
- Reference: Information source where reference information about the software resource can be found.
- Limitation: restrictions in using resource, including algorithm, compiler, portability, environment etc.
- Target environment: the computer system, operation system and compiler, to which resource motivates
- Version: version of the software resource
- Authentication method: Describe the method of evaluation or certification of the software resource, including the result of evaluation or certification, the date of certification, the person of certification etc.

Click ‘next’ button to the second step of publishing after filling in basic information.

#### **4.2.2 Upload resource entity**

In this step, you can upload artifacts produced during each stage in life cycle of the resource, including:

- Requirement artifacts: Artifacts produced during requirement analysis stage, e.g. use case diagrams, requirement analysis documents.
- Design artifacts: Artifacts produced during software design stage, e.g. class diagrams, design documents.
- Implementation artifacts: Artifacts produced during implementation stage, e.g. source code files, binary files. For a software resource of type ‘Service’, URL of its WSDL document is needed (necessary) in this category.
- Testing artifacts: Artifacts produced during testing stage, e.g. test cases, test report documents.
- Usage artifacts: Artifacts about usage of the software resource, e.g. user manual.

You can click "Continue to add..." option to upload multiple files for each category.

**upload resource entity information**

You can submit all artifacts in every stage through software life cycle(WSDL URL is required for a service; at least one kind of the following five artifacts is required for other resource types):

|                             |   |  |
|-----------------------------|---|--|
| upload requirement file     | G:\Program Files\SogouExplorer\changelog.txt [浏览...]<br>G:\Program Files\SogouExplorer\browser.conf [浏览...]<br>[删除]<br><a href="#">Continue to add requirement documents...</a> | You can click "Continue" to diagram, requirement spec etc. |
| upload design file          | G:\Program Files\SogouExplorer\LICENSE [浏览...]<br>[浏览...]<br>[删除]<br><a href="#">Continue to add design related files...</a>  | You can click "Continue A specification etc."              |
| upload implementation files | [浏览...]<br><a href="#">Continue to add implementation files...</a>  | You can click "Continue to etc."                           |
| upload test file            | [浏览...]<br><a href="#">Continue to add testing files...</a>   | You can click "Continue to report", etc.                   |
| upload resource help file   | [浏览...]<br><a href="#">Continue to add help files...</a>  | You can click "Continue to t                               |

[back](#) [next](#) [submit](#)

Figure 7. Upload entity files for resources of type ‘Component’ or ‘Tool’ or ‘Architecture’, or ‘Other’

**publish software resource, you need:** ① [fill in basic information](#) ② **upload resource entity** ③ [upload asset evidence](#) ④ [fill in](#)

**upload resource entity information**

You can submit all artifacts in every stage through software life cycle(WSDL URL is required for a service; at least one kind of the following five artifacts is required for o

|                             |  |
|-----------------------------|--|
| upload requirement file     | [浏览...]<br>Continue to add requirement documents...    |
| upload design file          | [浏览...]<br>Continue to add design related files...     |
| WSDL address of Web Service | <input type="text"/> Items with *must fill is required |
| upload test file            | [浏览...]<br>Continue to add testing files...            |
| upload resource help file   | [浏览...]<br>Continue to add help files...               |

[back](#) [next](#)

Figure 8. Upload entity files for resources of type ‘Service’

After selecting artifacts, click ‘next’ button to upload selected artifacts to server side, and then to step 3. You can click ‘back’ button to go back to step 1. You can also click ‘submit’ to submit the software resource to TSRR without filling information in step 3.

#### 4.2.3 Upload asset evidence

In this step, you can upload asset evidence of the software resource. The software asset evidence here is referred to be measurements, documents or other information that can reflect certain trust attributes of software assets.

Asset evidence template is basically an Excel file. If extra files are referenced by the template, use hyper links in Excel (NOTE: the referenced file should be in the same directory with the template). You can refer to the template file provided on the page for reference.

Evidence files for demonstration are available on the page.

Click ‘next’ button to step 4. Click ‘back’ to go back to step 2. You can also click ‘submit’ button to submit the software resource to TSRR directly without filling in quality information in step 4.

publish software resource, you need:

- 1 fill in basic information
- 2 upload resource entity
- 3 trust information
- 4 fill asset evidence

upload asset evidence

The software asset evidence here is referred to be measurements, documents or other information that can reflect certain asset evidence template is basically an Excel file.  
if extra files is referenced by the template, use hyper links in Excel (NOTE: the referenced file should be in the same directory). If you still confused about filling the asset evidence template, an example is also provided here. Example for evidence template  
asset evidence package upload it

please upload the asset evidence package  浏览...

[back](#) [next](#) [submit](#)

Figure 9. Upload asset evidence

#### 4.2.4 Submit Quality Information

This is the last step of the software resource publication in which users are requested to submit quality information of the published software resource. Quality information includes:

- Effectiveness: The capability of the software product to enable users to achieve specified goals with accuracy and completeness in a specified context of use.
- Satisfaction: The capability of the software product to satisfy users in a specified context of use.
- Safety: The capability of the software product to achieve acceptable levels of risk of harm to people, business, software, property or the environment in a specified context of use.
- Productivity: The capability of the software product to enable users to expend appropriate amounts of resources in relation to the effectiveness achieved in a specified context of use.
- Functionality, including the following 4 sub-characteristics:
  - Security: The capability of the software product to protect information and data so that unauthorized persons or systems cannot read or modify them and authorized persons or systems are not denied access to them.
  - Suitability: The capability of the software product to provide an appropriate set of functions for specified tasks and user objectives.
  - Accuracy: The capability of the software product to provide the right or agreed results or effects with the needed degree of precision.
  - Interoperability: The capability of the software product to interact with one or more specified systems.
- Reliability, including the following 3 sub-characteristics:
  - Recoverability: The capability of the software product to re-establish a specified level of performance and recover the data directly affected in the case of a failure.
  - Maturity: The capability of the software product to avoid failure as a result of faults in the software.
  - Fault tolerance: The capability of the software product to maintain a specified level of performance in cases of software faults or of

infringement of its specified interface.

● Efficiency, including the following 2 sub-characteristics:

- Time behavior: The capability of the software product to provide appropriate response and processing times and throughput rates when performing its function, under stated conditions.
- Resource utilization: The capability of the software product to use appropriate amounts and types of resources when the software performs its function under stated conditions.

● Usability, including the following 4 sub-characteristics:

- Attractiveness: The capability of the software product to be attractive to the user.
- Learnability: The capability of the software product to enable the user to learn its application.
- Understandability: The capability of the software product to enable the user to understand whether the software is suitable, and how it can be used for particular tasks and conditions of use.
- Operability: The capability of the software product to enable the user to operate and control it.

● Maintainability, including the following 4 sub-characteristics:

- Changeability: The capability of the software product to enable a specified modification to be implemented.
- Testability: The capability of the software product to enable modified software to be validated.
- Stability: The capability of the software product to avoid unexpected effects from modifications of the software.
- Analyzability: The capability of the software product to be diagnosed for deficiencies or causes of failures in the software, or for the parts to be modified to be identified.

● Portability, including the following 4 sub-characteristics:

- Adaptability: The capability of the software product to be adapted for different specified environments without applying actions or means other than those provided for this purpose for the software considered.
- Replaceability: The capability of the software product to be used in place of another specified software product for the same purpose in the same environment.
- Co-existence: The capability of the software product to co-exist with other independent software in a common environment sharing common resources.
- Installability: The capability of the software product to be installed in a specified environment.

The screenshot shows a software interface for publishing a software resource. At the top, there's a header with the logo 'Trustie' and the text 'Trust Integrated Environment for sharing and development Software Resource Repository'. Below the header, a navigation bar includes 'Home', 'Publish', 'Retrieve', 'Feedback', 'Statistics', 'MyResources', 'Version 2.1.2', '中文版', and 'English'. A user 'superca1' is logged in. The main content area is titled 'publish software resource, you need: ① fill in basic information ② upload resource entity ③ upload asset evidence ④ 填写质量信息'. Step 4 is highlighted with a red circle. The 'Quality' section contains various performance metrics each with a set of radio buttons for levels 1 to 5. Metrics include: 有效性 (Effectiveness), 生产率 (Productivity), 安全性 (Safety), 满意度 (Satisfaction), 维护性 (Maintenance), 可移植性 (Portability), 功能性 (Functionality), 适应性 (Adaptability), 易安装性 (Easy Installation), 共存性 (Coexistence), 易替换性 (Easy Replacement), 适合性 (Suitability), 准确性 (Accuracy), 互操作性 (Interoperability), and 保密安全性 (Confidentiality Security). Each metric has five levels: 1级 (Level 1) to 5级 (Level 5).

Figure 10 Submitting quality information

Press "Submit" to finish the publication process after filling the quality information. Users can also click the "Previous" button to return to the 3rd step.

Detailed Information of the software resource published just now will be displayed after users finish the publication process, as shown in Fig. 11.

The screenshot shows a software interface for viewing the details of a published software resource. At the top, there's a header with the logo 'Trustie' and the text 'Trust Integrated Environment for sharing and development Software Resource Repository'. Below the header, a navigation bar includes 'Home', 'Publish', 'Retrieve', 'Feedback', 'Statistics', 'MyResources', 'Version 2.1.2', '中文版', and 'English'. A user 'superca1' is logged in. The main content area is titled 'Current Location: view resource message'. The 'basic information' section contains fields for: Keywords (abc\_superca1), Type (Component), date of being published (2010-09-28 13:33:02.972), Abstract (abc\_superca1), fee (commercial), Version, Target Environment, access address, Authentication method, Software License, and UUID (DCF770F0-CAC1-11DF-968D-F5A008DEE1E3). The 'Entity information' section shows Binding Template1 (DE422560-CAC1-11DF-968D-F5A008DEE1E3) and Access Address (abc\_superca1 20100928013304.ras). The 'Tag' section allows adding new tags. On the right, a 'classification tree' panel lists terms: Application Domain, Application Environment, Functionality, Level, and Representation. The selected term is 'Level'.

Figure 11. Detailed information page of software resource

#### 4.3 Modify the Information of Software Resource

If any information of the software resource has been changed after publication, users can update the changed information to the repository by click the "Modify" link

located at the bottom of the detailed information page.

The modification process is similar to the publication one, including 4 steps:  
 1)Modify the basic information, 2)Modify the entity files, 3)modify the evidence for trustworthiness evaluation and 4)Modify the quality information.

- The modification page of the basic information is shown in Fig. 12. Former basic information of the software resource is automatic filled and all these information, including the classification tree at the right side, can be re-edited.

The screenshot shows the 'Trust Integrated Environment for sharing and development Software Resource Repository' interface. The main content area is titled 'basic information' and contains various input fields for modifying software resource details. On the right side, there is a 'classification tree' with a hierarchical structure of categories. Four numbered circles (1, 2, 3, 4) are overlaid on the interface, pointing to specific sections: 1 points to the 'Fill in basic information' button; 2 points to the 'upload resource entity' button; 3 points to the 'upload asset evidence' button; and 4 points to the 'fill in quality information' button.

Figure 12. Modifying the basic information of software resource

- Press "Next" to update the entity files of the software resource. In the following page, all the entity files are displayed in categories at the left side. Users can delete entity files by selecting the corresponding checkbox. As shown in Fig. 13, users can also add new entity files of different type (such as requirement files, or development files etc) by clicking the corresponding "Browse..." Button at the right side to upload them.

The screenshot shows the 'upload resource entity information' step. It displays a list of artifact types: requirement, design file, implementation files, test file, and resource help file. Each type has an 'upload' button and a 'Continue to add...' link. A note at the top says: 'Please select the files you intend to cancel: These are the existing files of this resource, select the checkbox if you intend to cancel the corresponding file:'. There are checkboxes for 'requirement' and 'ISO9126.pdf'. At the bottom are 'back', 'next', and 'submit' buttons.

Figure 13. Modifying the entity files of software resource

- Click "Next" to update the evidence information. In this step, users can update the evidence information by re-uploading the evidence package. If no modification has been made, go next step by clicking the "Next" button or complete the modification process by clicking the "Submit" button. The modification page of the evidence information is shown below in Fig. 11.3.

The screenshot shows the 'trust information' step. It contains instructions about asset evidence templates being measurements, documents, or other information reflecting software assets. It explains how to handle referenced files in Excel templates. A note at the bottom says: 'If you still confused about filling the asset evidence template, an example is also provided here. Example for evidence template.' Below is a 'Please upload the asset evidence package' input field with a '浏览...' button. At the bottom are 'back', 'next', and 'submit' buttons.

Figure 14. Modifying the evidence information of software resource

- Press "Next" to update the quality information. Users will enter the quality information modification page as shown in Fig. 11.4.

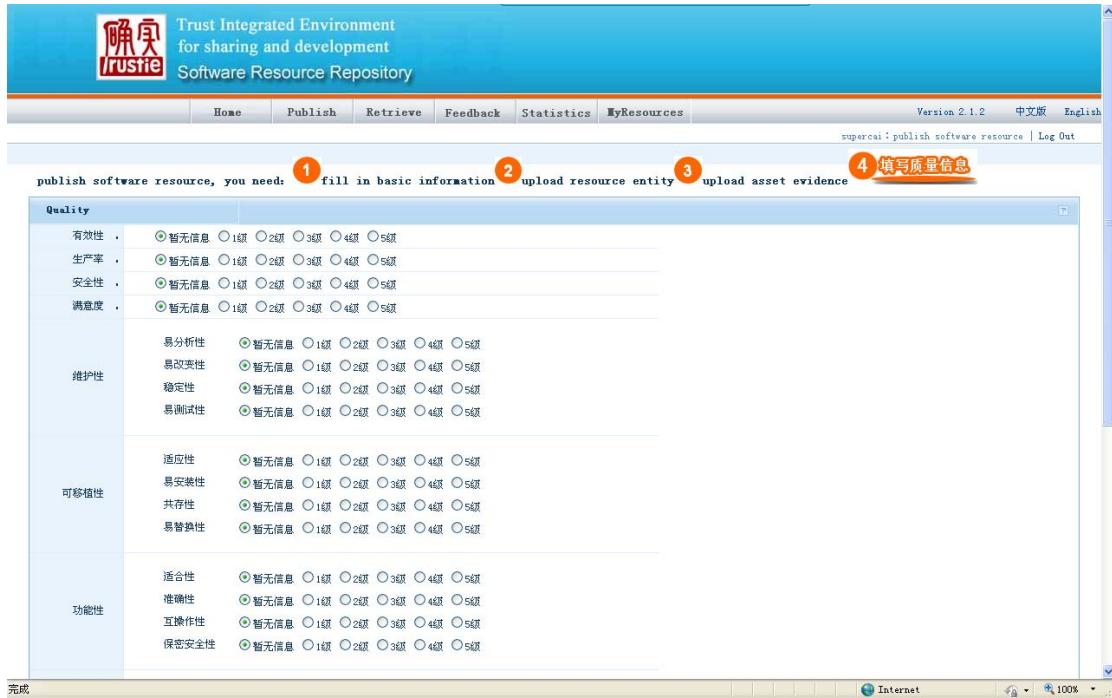


Figure 15. Modifying the quality information of software resource

- By clicking the "Submit" button, the updated information of the software resource will be stored. System will automatically jump to the detailed information page with latest information displayed.

#### 4.4 Retrieve Software Resource

The main function of retrieve is to help users search, browse, select and download the software resources on demand. There are two kinds of users who have the right to retrieve software resource in Software Resource Repository. One is guest, the other is registered user. Guests are able to retrieve, but not to download software entities. Only after login, one can download entities of software resources.

The retrieve includes simple retrieve, advanced retrieve, retrieve based on tags and retrieve based on classification.

##### 4.4.1 Simple Retrieve

Simple retrieve is the search tool in the middle of homepage, as shown in figure 7.

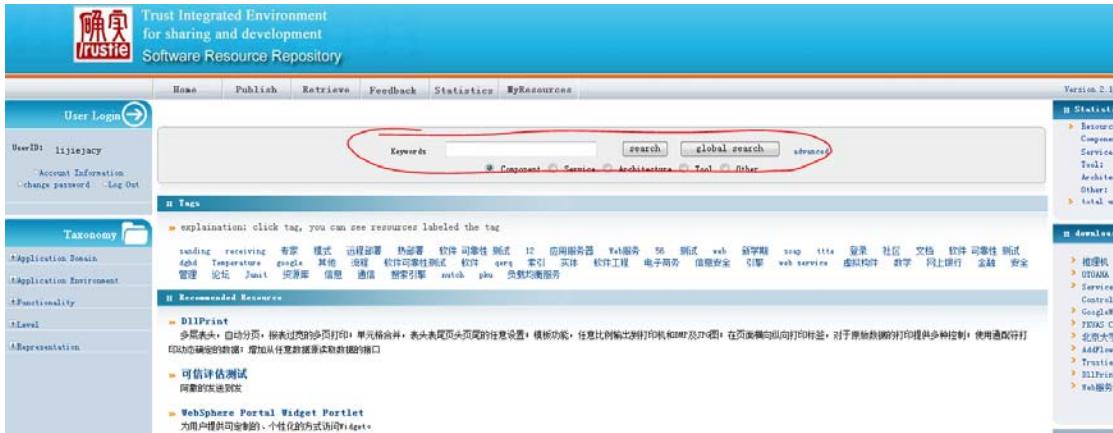


Figure 16. Simple retrieve interface in homepage

Keywords: keywords to be retrieved, such as resource name.

Type: software resource type, including component, web service, architecture, tool and other.

#### 4.4.2 Advanced Retrieve

Click “Retrieve”, enter advanced retrieve page, as shown in figure 15.

Figure 17. Advanced retrieve page of software resource repository

User should fill in attributes of advanced retrieve, including:

- Name: name or part name of the software resource which would be retrieved. It can be empty, which means no restriction to software resource name.
- Type: software resource type, including component, web service, architecture, tool and other. The default type is component.
- Publisher: publisher of software resources. It can be empty, which means no restriction to software resource publisher.
- Included tags: tags which are included in software resources. Separate different tags with comma. It can be empty, which means no restriction to software resource including tags.
- Excluded tags: tags which are excluded in software resources. Separate different tags with comma. It can be empty, which means no restriction to software resource excluding tags.

- Classification: select relevant classification from the classification tree, meaning retrieving software resources in the selected classification. It can be empty, which means no restriction to classification.
  - The order of evaluation templates: select the order type of the retrieve results. The results are ordered according to the selected templates. The default order type is according to publish time.
  - Quality information: the restriction of software resource quality. The detail of quality is shown in advanced retrieve page.
  - One can choose local retrieve or global retrieve. Local retrieve refers to retrieve only in this repository. Global retrieve means the retrieve executed in all the repositories which are registered in the current configuration. The global retrieve is configured by administrators..
- Click “submit”, and results will come out.

#### 4.4.3 Retrieve Based on Tags

The middle section of homepage is a collection of software resource tags. Click one of these tags, retrieve based on tags will be executed.



Figure 18. Retrieve based on tags interface

Click one tag, all the resources which include the tag will be shown in a retrieve result page.

The screenshot shows the Trust Integrated Environment Software Resource Repository interface. At the top, there is a logo with Chinese characters '确实' and the English word 'trustie'. Below the logo, the text 'Trust Integrated Environment for sharing and development' and 'Software Resource Repository' is displayed. A navigation bar at the top includes links for Home, Publish, Retrieve, Feedback, Statistics, and MyResources. On the left, there is a 'User Login' section with a red arrow icon, showing a UserID of 'lijiejacy' and links for Account Information, change password, and Log Out. Below the login is a 'Taxonomy' section with a folder icon, listing categories: Application Domain, Application Environment, Functionality, Level, and Representation. The main content area is titled '# Results' and shows search results for 'Keywords' (empty). It includes search buttons for 'search', 'global search', and 'advanced'. Below this, a search bar shows 'Page1 Total13page Total64results Home Next end page jump to page GO'. The results list contains five entries:

- XWeb1003**: Overview: XWeb1003 is an XML/SOAP based Web Service which provides integration and management of the Uniform Residential Mortgage Loan Application (Form 1003) to client applications.
- XWebBlog**: Overview: XWebBlog is an XML/SOAP based Web Service which provides integration and management of a Weblog (Blog) to client applications.
- bookstoreservice**: Overview: Example of a bookstore webservice (author, prize, title, availability).
- statedemo**: Overview: Webservice example for state management.
- XWebSurvey**: Overview: XWebSurvey is an XML/SOAP based Web Service which provides integration and management of Surveys (Polls) to client applications. For complete documentation please visit [http://www.xwebservices.com/Web\\_Services/XWebSurvey/](http://www.xwebservices.com/Web_Services/XWebSurvey/).

Figure 19. Results list of retrieve based on tags

#### 4.4.4 Retrieve Based on Classification

Software resource repository provides classification for organizing software resources, and supports retrieve based on classification. Classification can be thought as a tree without root value. The direct children of root are called facets. The children of facets are **term**(术语?)s. Every facet is a space consisted of terms. When publishing a software resource, the publisher can select some terms from the classification. Then the resource will be classified into the selected terms. One can click the node to expand the facets and terms. By clicking one term, one can retrieve based on classification. Afterwards, the software resources classified into that term will be returned. As shown in figure 18.



Figure 20. Retrieve based on classification interface

## 4.5 FeedBack

Feedback is users' opinion and evaluation on the software resources in the software resource repository.

### 4.5.1 Feedback Template

As mentioned in advanced software resource retrieve (4.4.2), the retrieve result can be ranked according to feedback template. In other words, a feedback template can be used to rank the candidate software resource in retrieve result.

In the software resource repository, users could customize feedback template based on their profile.

At the bottom of resource detail page, click "add new quality feedback" button and head into the page shown as the figure below.

The screenshot shows a feedback form titled '添加资源质量信息' (Add Resource Quality Information). At the top, there are tabs for '首页' (Home), '发布资源' (Publish Resources), '检索资源' (Search Resources), '反馈评估' (Feedback Evaluation), '统计分析' (Statistical Analysis), and '我的资源库' (My Resource Library). A 'Version' dropdown is also present.

The main area contains a table for quality information evaluation. The columns represent different aspects: '总体满意度' (Overall Satisfaction), '有效性' (Effectiveness), '生产率' (Productivity), '安全性' (Safety), '满意度' (Satisfaction), '维护性' (Maintenance), '可移植性' (Portability), and '功能性' (Functionality).

For each aspect, there is a section for '总体评价' (Overall Evaluation) with a dropdown menu. Below this, specific evaluation items are listed with radio buttons for ratings from 1 to 5. For example, under '有效性' (Effectiveness), the items are: '无反馈' (No feedback), '1级' (Level 1), '2级' (Level 2), '3级' (Level 3), '4级' (Level 4), and '5级' (Level 5).

At the bottom right of the form, there are buttons for '保存' (Save), '取消' (Cancel), and '应用' (Apply).

Figure 21. Feedback Template's Detail Information (中文图)

## 4.6 Statistics

Statistics provides the usage information of software repository for users. There are two majors statistics, which are overall information of the system and the software resource repository profile.

### 4.6.1 System Overall Information

The software resource repository makes statistics of the number of resources, the number of users, publish information of software resources and information of visiting the repository. The overall information page contains user number and resource number of the system.

Click “statistics” button, then users could head into the system’s overall information page. There are two aspects information, resource repository overview information and updated information.



Figure 22. Overall Information of Software Resource Repository

Users can look over seven types statictic information in the system overall information page.

- User number: the number of registered users in software resource repository.
- Resource number: the number of software resources in the repository.
- Reuse number: the number of download times of RAS package.
- New component number: new added component number in the last 3, 7 or 30 days
- New service number: new added service number in the last 3, 7 or 30 days
- New tool number: new added tool number in the last 3, 7 and 30 days
- New architecture number: new added architecture number in the last 3, 7 and 30 days.
- Number of others: other added resource number in the last 3, 7 and 30 days.

In the updated information table, user can select “3 days”, “7 days” or “30 days” to look up for the number of newly added software resources. User can input the start date and the end date to look up the number of sofware resource that have been updated. In the same time, User can click “trend chart” button to view the growth of the user, software resource, component, and others.

#### 4.6.2 Resource Profile

Resource profile provides statistics information of components and services in the respository. Shown as below, There are three types of statistic information, which are the software resource category information, the resource in each detailed category and the resource price information.



Figure 23. Resource Profile of Software Resource Repository

**information of resource category, information of resource detailed classification and the information of resource price.**

#### 4.6.3 Trustie Evaluation Information

There are some statistics of components and services in the Trustie evaluation information page. Following are the main parts.



Figure 24. Trustie Evaluation Information

## 4.7 My Resource Repository

Click “My Resource Repository” to enter personal software resource repository service module for registered user. This module includes “my published resource”, “downloaded resource”, “viewed resource”, “feedback on my published resources” and “my feedback”. This page is shown in the following figure.

The screenshot shows the "Software Resource Repository" interface. At the top, there's a logo for "TrustIE" and the text "Trust Integrated Environment for sharing and development". Below the header, there are navigation links: Home, Publish, Retrieve, Feedback, Statistics, and MyResources. On the right, it says "Version 2.1.2 中文版 English Admin: my resource library | Log Out".

**Welcome, Admin modify account information**

**my published resource (ordering in publish time)**

- » boring: downloads:0 publish time:2010-04-18 14:05:13.0
- » c52zxecc: downloads:0 publish time:2010-04-12 10:36:41.0
- » 大发生大幅度: downloads:0 publish time:2010-03-17 16:44:17.0

[view all](#)

**downloaded resource (ordering in download time)**

- » 中创精英展示构件: downloaded time:2010-06-30 10:28:48.0
- » 推理机: downloaded time:2010-03-11 17:18:23.0
- » 可信软件资源库部署EAR包: downloaded time:2010-03-11 15:55:06.0

[view all](#)

**viewed resource (ordering in view time)**

- » 推理机: View Time:2010-09-08 14:08:00.0
- » PKUAS Container: View Time:2010-09-08 14:07:47.0

[view all](#)

**feedback on my published resources (ordering by feed back time)**

- » feedback1: Related Resources: c52zxecc; feedback publisher: Admin; published time of feedback:2010-04-12 10:36:44.0
- » feedback2: Related Resources: 大发生大幅度; feedback publisher: Admin; published time of feedback:2010-03-17 16:44:20.0
- » feedback3: Related Resources: sifisif; feedback publisher: Admin; published time of feedback:2010-01-15 09:54:56.0

[view all](#)

**my feedback (ordering in publish time)**

- » feedback1: Related Resources: c52zxecc; published time of feedback:2010-04-12 10:36:44.0
- » feedback2: Related Resources: 大发生大幅度; published time of feedback:2010-03-17 16:44:20.0
- » feedback3: Related Resources: sifisif; published time of feedback:2010-01-15 09:54:56.0

[view all](#)

Figure 25. My Resource Repository

- My published resource: list the resources published by the logged-in user, ordering in publish time.
- Downloaded resource: list the resources downloaded by the logged-in user, ordering in download time.
- Viewed resource: list the resources viewed by the logged-in user, ordering in view time.
- Feedback on my published resources: list the feedbacks of the logged-in user’s published resources, ordering in feedback publish time.
- My feedback: list the feedbacks published by the logged-in user, ordering in feedback publish time.

The functions above all have “view all” hyperlinks. Click “view all” to see all the resources related to the specific function.

## 4.8 Administrator Console

Administrator can manage the whole resource library. The account for administrator is “Admin” and the default password is “Admin”. Administrator can click “System management” to enter the administrator console after logging in. The page of the administrator console is shown in the following figure.



Figure 26. Administrator console

Administrator console has the following functions: “User Management”, “Taxonomy Management”, “Tag Management”, “Evaluation Template Management”, “Resource Management”, “Trustiness Management” and “Configuration Management”.

#### 4.8.1 User Management

Through “User Management”, administrator could add a personal user account or a corporate user account. Besides, searching and viewing all the user accounts are available.

Administrator can disable a user account, which will ban the user from publishing resources. Meanwhile, administrator can also enable a disabled user account.

| 所有 用户     |             |      |                 |                          |             |          |
|-----------|-------------|------|-----------------|--------------------------|-------------|----------|
| 用户名       | 真实姓名        | 账户状态 | 所属组织人           | Email                    | 电话          | 地址       |
| 10740248  | chenghuiwen | 个人用户 | 否               | chenghuiwen@gmail.com    | 空           | 空        |
| 11111     | 山高水长        | 是    | 11111@11111.com | 空                        | 空           | ✓        |
| 123hour   | 0 0 0       | 个人用户 | 否               | user@seient.com          | 空           | ✓        |
| 34241669  | 海潮          | 个人用户 | 否               | 34241669@qq.com          | 空           | ✓        |
| 3116      | 董峰慧         | 个人用户 | 否               | lisk@seient.com          | 空           | ✓        |
| 5021537   | 李占伟         | 个人用户 | 否               | 5021537@qq.com           | 空           | 空        |
| 311107123 | 刘强          | 个人用户 | 否               | liuqiang.happy@gmail.com | 15111443446 | ✓        |
| ABAAPS    | 郝健军         | 个人用户 | 否               | shyj_@126.com            | 空           | ✓        |
| Admin     | ABAAPS00000 | 个人用户 | 否               | Admin@CLDQ               | 627513601   | 62751792 |
| Alice     | 曾强          | 个人用户 | 否               | alice@seient.com         | 空           | ✓        |

Figure 27. User Management

## 4.8.2 Taxonomy Management

### 4.8.2.1 Publish a new taxonomy

Administrator can view all the available taxonomies in TSR. Besides, administrator can publish a new taxonomy by click the button of “Publish Taxonomy”. The publish process is shown as follows:

Firstly, a name for the new taxonomy is necessary. This name will be set as the root of the new taxonomy. When a new node needs to be added, users can select a node as parent and click “add”. Then, the new added node will be the child of the node selected. Click “commit” after editing the new taxonomy to finish the taxonomy publishing process.

The following figure shows a taxonomy being edited.

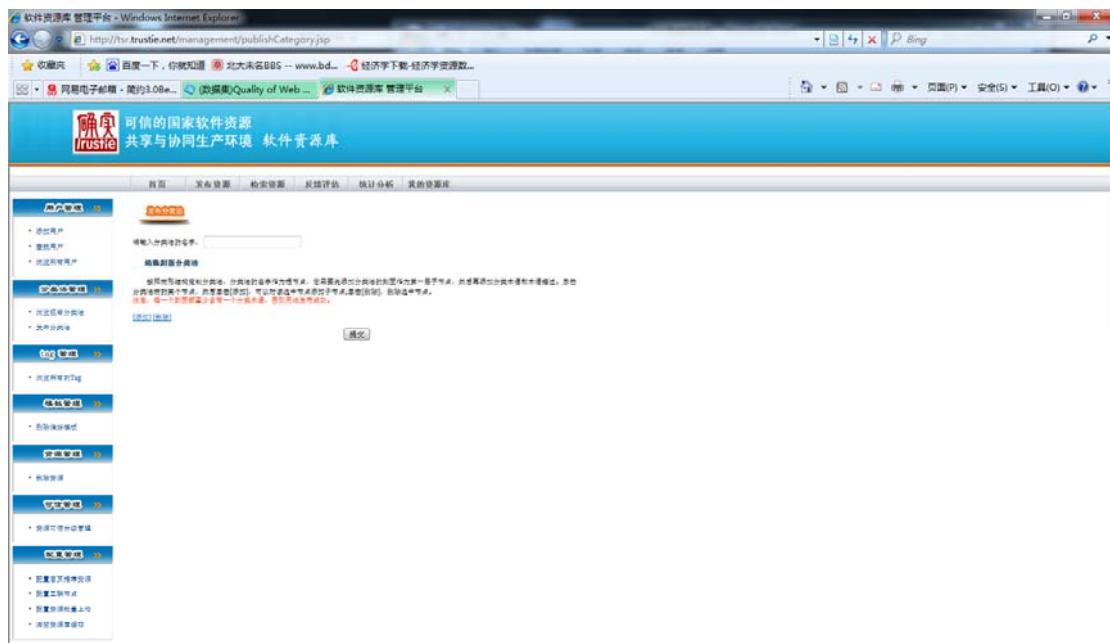


Figure 28. Taxonomy Management

### 4.8.2.2 View Available Taxonomies

Click “View Available Taxonomies” in the administrator console. The page shown in the following figure will appear.

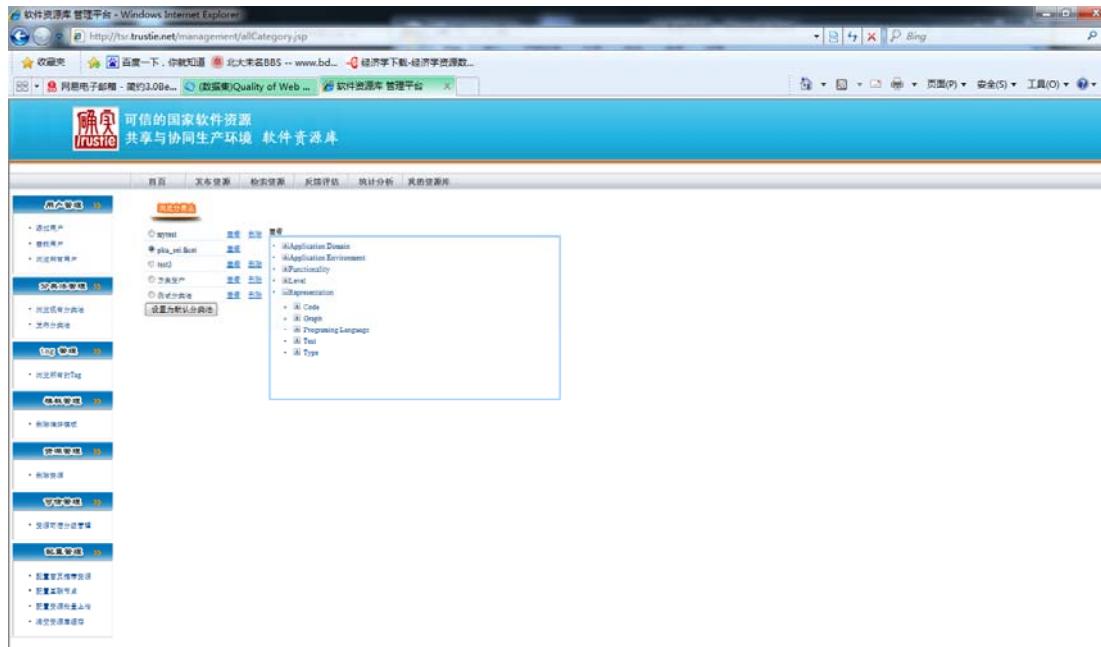


Figure 29. View Available Taxonomies

Select the taxonomy which needs to be used and click “Set as Default Taxonomy”. Default taxonomy will be shown in the left sidebar of the home page.



Figure 30. Taxonomy on homepage

### 4.8.3 Tag Management

Administrator can manage the tags added by users. Viewing all the tags and deleting an unnecessary tag is accessible to administrator.



Figure 31. Tag management

#### **4.8.4 Evaluation Template Management**

Administrator can delete an evaluation template currently available.

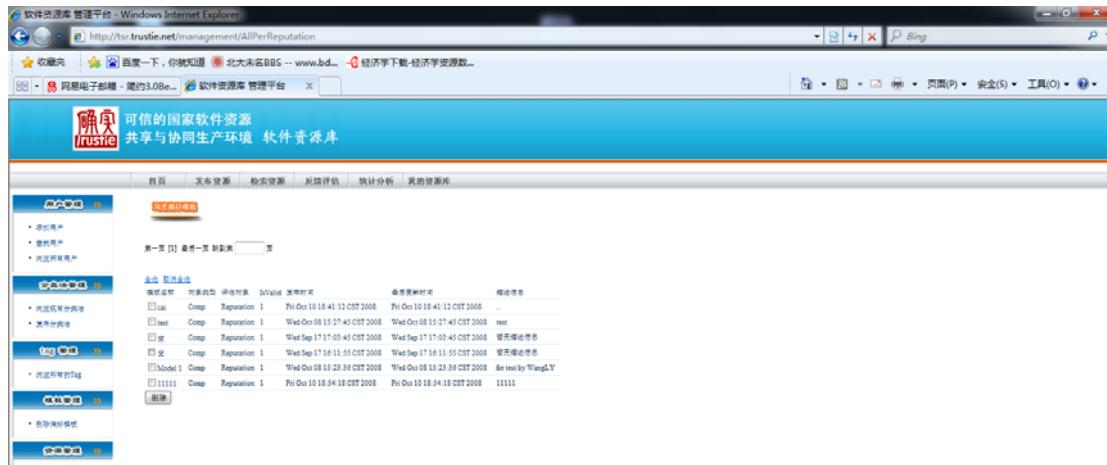


Figure 32. Evaluation Template Management

#### **4.8.5 Delete Software Resource**

Administrator can delete a software resource currently available.



Figure 33. Delete resource

#### 4.8.6 Software Resource Trustworthiness Classification Management

Trustworthiness levels of the software resources in TSR are classified by experts. The configure method is :

(1) **Configure experts list:** The configuration file named *ExpertsNameList.txt*, which is located at the directory *conf\tsrr\_conf* of Jonas installation path, is used to configure the list of experts as shown in Figure 32. The administrator of TSR can add or delete any user of TSR into this file. Once a user's name is added to this configuration file, the user becomes an expert. When you configure the list, please note that (1) one user's name holds a line, (2) there is no punctuation among the names, and (3) the user must exist in TSR. E.g. see the Figure 33.

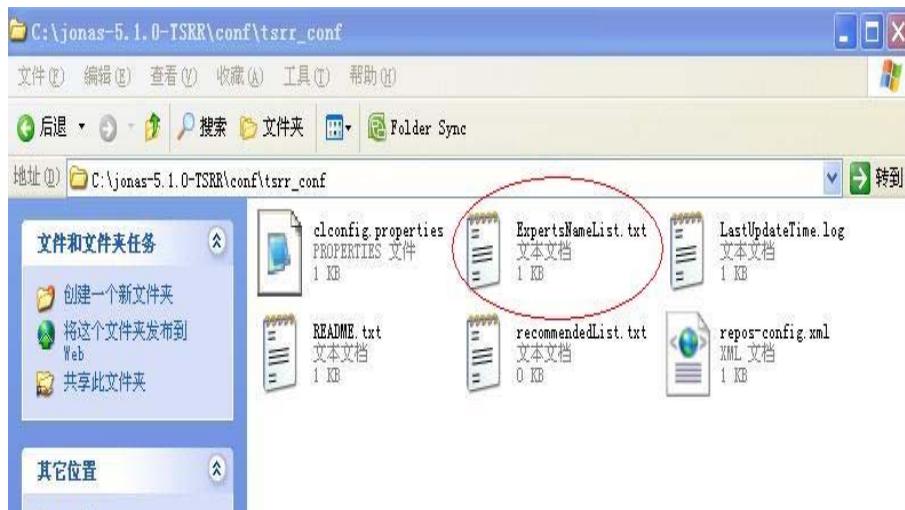


Figure 34. the path of the experts list configuration file



Figure 35. configure the experts list

**(2) Trustworthiness classification:** If any user in experts list adds feedbacks to a software resource, the administrator of TSR can see the feedback information by clicking “Software Resource Trustworthiness Classification Management”. For example, if the user named *Admin* has been added to the experts list, and adds feedbacks to two resources named “社区需求捕获模式” and “WebSphere Portal Widget Portlet”, the administrator of TSR will see the following page:

| 反馈者                                       | 构件名称                            | 构件级别 | 评价描述 |
|---|---------------------------------|------|------|
| <input checked="" type="checkbox"/> Admin | 社区需求捕获模式                        | 3.0  |      |
| <input checked="" type="checkbox"/> Admin | WebSphere Portal Widget Portlet | 4.0  | 设计合理 |

Figure 36. software resource trustworthiness classification management

The administrator of TSRR can select the resources to be classified, and click the button of “*confirm the classification*” to classify these resources. When users browse some software resources that have been classified, the software resource’s trustworthiness level classified by the experts will be shown on the web page as shown in Figure 35.

当前位置： 查看资源信息

| 基本信息  |                                      | 可信级别 | 三级 ★★★★               |
|-------|--------------------------------------|------|-----------------------|
| 名称    | 社区需求捕获模式                             |      |                       |
| 资源类型  | 构件                                   | 发布者  | hxzj_2                |
| 入库时间  | 2009-05-12 08:30:55.0                | 更新时间 | 2009-05-12 08:31:02.0 |
| 摘要    | 社区需求捕获模式                             |      |                       |
| 费用    | commercial                           | 价格   |                       |
| 版本    |                                      | 参考   |                       |
| 目标环境  |                                      | 限制   |                       |
| 访问地址  |                                      |      |                       |
| 认证方法  |                                      |      |                       |
| 软件许可证 |                                      |      |                       |
| UUID  | 27F206D0-3E8C-11DE-803F-DE2336E1FA15 |      |                       |

Figure 37. The trustworthiness level information of a software resource

#### 4.8.7 Configure Recommended Resources in Home Page

“Recommended Resources in Home Page” refers to the resource list named “Recommended Resource” in the center of the home page.

The screenshot shows the homepage of the Trust Integrated Environment Software Resource Repository. The top navigation bar includes links for Home, Publish, Retrieve, Feedback, Statistics, and MyResources. On the left, there is a User Login form and a Taxonomy sidebar with categories like Application Domain, Application Environment, Functionality, Level, and Representation. The main content area features a search bar with dropdown filters for Component, Service, Architecture, Tool, Other, and all. Below the search is a 'Tags' section with a link to 'View all tags'. A red box highlights the 'Recommended Resource' section, which contains a list of recommended components. To the right, there is a 'Statistics' panel showing various resource counts and a 'download ranking' panel listing popular resources. The bottom right corner has links for 'Contact Us' and 'Feedback'.

Figure 38. "Recommended Resource" in the home page

Click “Configure Recommended Resources” in the administrator console to enter the configuration page.

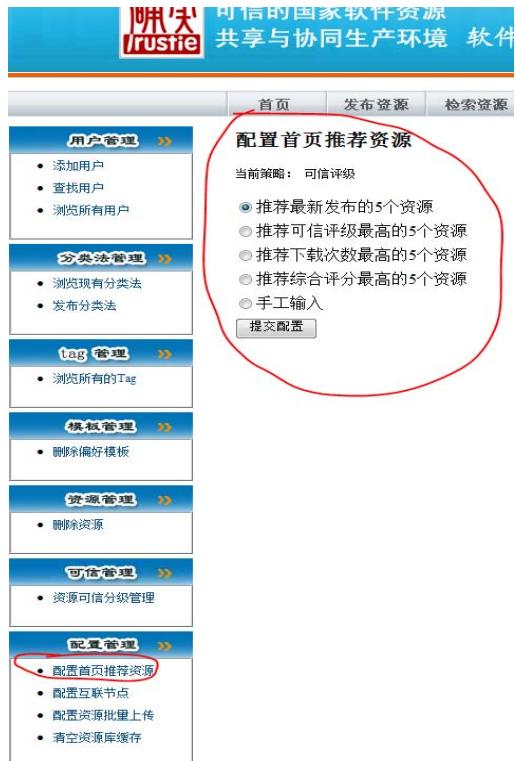


Figure 39. Configure “recommended resources”

There are five choices:

- Recommend top five newest published resources

System will show the top five newest published resources in the home page automatically,

- Recommend top five highest trustiness level resources

System will show the top five highest trustiness level resources in the home page automatically,

- Recommend top five most downloaded resources

System will show the top five most downloaded resources in the home page automatically,

- Recommend top five comprehensive ranked resources

System will show the top five comprehensive ranked resources in the home page automatically,

- Input manually

Administrator needs to input the resources to be shown in the “Recommended Resource” section. The following page will appear after selecting this option.

- 当前策略： 可信评级
- 推荐最新发布的5个资源
  - 推荐可信评级最高的5个资源
  - 推荐下载次数最高的5个资源
  - 推荐综合评分最高的5个资源

手工输入

|                    |                      |
|--------------------|----------------------|
| 请输入推荐资源的UUID Key值: | <input type="text"/> |

[继续增加推荐资源](#)

[提交配置](#)

Figure 40. Configure “recommended resources” by input manually

Input the UUIDs of the recommended resources in the input boxes and then click “Commit Configuration” to finish. UUID of a resource could be accessible by the detail page of this resource, as shown in the following figure.

The screenshot shows a web interface for managing software resources. At the top, there's a logo for 'Trust Integrated Environment for sharing and development' and 'Software Resource Repository'. The navigation bar includes links for Home, Publish, Retrieve, Feedback, Statistics, MyResources, Version 2.1.2, Chinese, English, and Log Out. Below the navigation, it says 'Current Location: view resource message'.

**basic information**

|                         |   |                  |                            |
|-------------------------|---|------------------|----------------------------|
| Keywords                | PKUAS Container   | Trustiness Level | 四级 ★★★★                    |
| Type                    | Component   | publisher        | maxj07                     |
| date of being published | 2009-05-21 07:21:42.0   | updated time     | 2009-05-21 07:24:09.0      |
| Abstract                | Peking University Application Server(PKUAS)是符合JEE5规范的J2EE应用服务器。EJB Container是其核心模块。容器Container是构件所处的环境，为构件提供直接的运行时刻支持。PKUAS Container为符合J2EE1.4/JEE1.5规范的EJB2.0及EJB3.0提供了运行环境，为国内外首个实现... |                  |                            |
| fee                     | open  | Price            | 0                          |
| Version                 | J2EE应用服务器   | Reference        | J2EE 1.4/1.5 Specification |
| Target Environment      | J2EE应用服务器   |                  |                            |
| access address          |   |                  |                            |
| Authentication method   | 北京大学研制的“新型构件化应用服务器PKUAS”于2007年6月29日通过“新型构件化应用服务器”鉴定委员会进行的技术鉴定。  |                  |                            |
| Software License        | LGPL  |                  |                            |
| UUID                    | FA117CE0-4594-11DE-8985-C582670E48AE  |                  |                            |

**classification tree:**

the selected classification terms is the classification of the software resource

- Application Domain
- Application Environment
- Functionality
- Level
- Representation

Figure 41. UUID of a Software Resource

## 4.8.8 Repository Interconnection Configuration



Figure 42. Repository Interconnection Configuration

In this page, users can configure the name and the address of local resource repository so as to add new repository interconnection points. After this configuration, we can explore all repositories when search a software resource (jar, web service, etc.) The query page is shown as follows:



Figure 43. Universal software resource retrieval

## 4.8.9 Resource Batch Upload Configuration



Figure 44. Resource Batch Upload Configuration

A repository administrator can upload amount of software resource. These software resource are stored as their name are described in an excel file and their entities are put in a catalogue. In the same time, the administrator should set the user name and its password to publish these software resource.

## 4.8.10 Flush the Cache of the Resource Repository

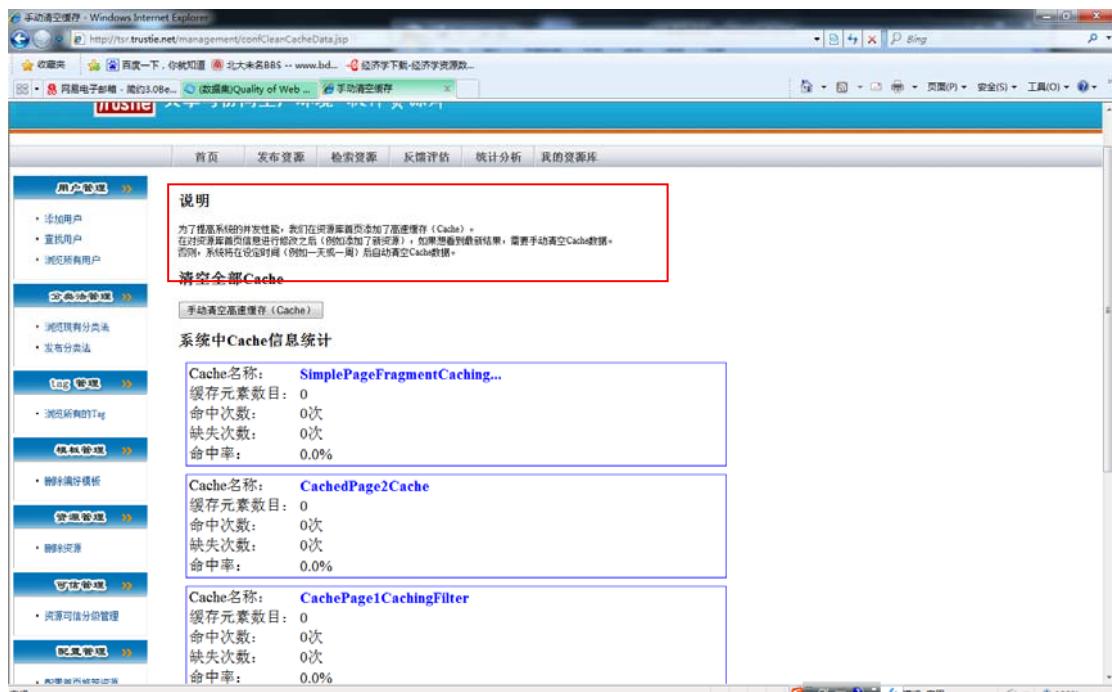


Figure 45. Flush the Cache of the Resource Repository

Only when administrator wants to see the latest result after changing the resource repository system(add some new recommend resources, etc.) shall he use this function. Otherwise, the system will clear the cache every few days.